

1 **Table S4:** Results of MINEQL+ modeling of Hg speciation in Aquificae culture media  
 2 with thiosulfate ( $\text{S}_2\text{O}_3^{2-}$ ) and hydrogen ( $\text{H}_2$ ) as sole energy sources.<sup>1</sup>

| Electron Donor              | Hg(II) speciation                          | Boone's Medium #2 <sup>2</sup> | Boone's Medium #5 <sup>3</sup> |
|-----------------------------|--|--------------------------------|--------------------------------|
| $\text{S}_2\text{O}_3^{2-}$ | % $\text{Hg}(\text{S}_2\text{O}_3)_2^{-2}$ | 84.1                           | 84.1                           |
|                             | % $\text{Hg}(\text{S}_2\text{O}_3)_3^{-4}$ | 15.9                           | 15.9                           |
| $\text{H}_2$                | % $\text{HgCl}_{2(\text{aq})}$             | 61.2                           | 85.3                           |
|                             | % $\text{HgClOH}_{(\text{aq})}$            | 33.1                           |                                |
|                             | % $\text{Hg}(\text{Cl}_3)^{-1}$            | 3.3                            | 13.7                           |
|                             | % $\text{Hg}(\text{OH})_2$                 | 2.4                            |                                |

3 <sup>1</sup>Modeled media contained 10  $\mu\text{M}$   $\text{HgCl}_2$ . No Hg-dependent speciation difference was  
 4 observed from 2-60  $\mu\text{M}$   $\text{HgCl}_2$ .

5 <sup>2</sup>Boone et al. 1989(1)

6 <sup>3</sup>Shima et al. 1993(3)

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